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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/586,130	06/02/2000	Raman Viswanathan	584-23196-US	6331

24923 7590 05/19/2004
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EXAMINER

DANG, HUNG Q

ART UNIT PAPER NUMBER

2635

DATE MAILED: 05/19/2004

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/586,130

Applicant(s)

VISWANATHAN, RAMAN

Examiner

Hung Q Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6,8-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>18</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to applicant's amendment received on 4/2/2004. The canceled claims 1, 7 and the amended claims 2, 4, 6, 8-12 have been entered.

Response to Arguments

2. Applicant's arguments regarding claims 6 and 8 (on page 7) have been fully considered but they are not persuasive.

Applicant's main argument (on page 7) is that the prior arts do not teach or suggest a well logging data cable comprising at least one twisted pair of conductors and **at most** six/seven twisted pairs of conductors.

Examiner asserts that Paulsson II does suggest a data transmission cable (Figure 1 unit 30 and column 5 lines 34-46) linking the transmitter and the receiver. Said cable being a twisted pair cable (column 5 lines 21-33; conventional twisted pair cable has been known for having AT LEAST one twisted pair of signal conductors, each of the conductors being separately insulated). (The claimed language "the cable having AT LEAST ONE twisted pair of signal conductors.....and.....AT MOST SIX/SEVEN twisted pairs of conductors" indicates that the number of twisted pairs of conductors can be anywhere from ONE pair to SIX pairs). Therefore, applicant's arguments are not persuasive.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 6, 8, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulsson U.S. Patent 6,206,133 in view of Bowers U.S. Patent 3,259,675 and in further view of Oswald et al. U.S. Patent 6,127,632.

Regarding claim 6, Paulsson teaches a well logging system comprising:

- A downhole well data sensor (column 5 lines 34-46 unit 22);
- A downhole data transmitter (inherent);
- A surface data receiver (inherent); and
- A data transmission cable (Figure 1 unit 30 and column 5 lines 34-46) linking the transmitter and the receiver. Said cable being a twisted pair cable (column 5 lines 21-33; conventional twisted pair cable has been known for having AT LEAST one twisted pair of signal conductors, each of the conductors being separately insulated). (The claimed language "the cable having AT LEAST ONE twisted pair of signal conductors.....and.....AT MOST SEVEN twisted pairs of conductors" indicates that the number of twisted pairs of conductors can be anywhere from ONE pair to SIX pairs).

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However, Paulsson does not specifically teach said transmission twisted pair cable further has an insulation sheath surrounding the twisted pair of conductors and a tensile load carrier surrounding the insulation sheath, the load carrier comprising a sheath of tensile load carrying filaments.

Bowers teaches a cable for use in borehole environment (column 1 lines 15-20 and Figures 1 and 2). Said cable has a sheath (Figure 2, unit 14) surrounding the multi-conductors (Figure 2, unit 14) and a tensile load carrier surrounding the insulation sheath, wherein said tensile load carrier comprises a sheath of tensile load carrying filaments (Figure 2, units 10-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a sheath surrounding the twisted pair of conductors and a tensile load carrier surrounding the insulation sheath, wherein the load carrier comprising a sheath of tensile load carrying filaments, to the transmission cable disclosed by Paulsson, as evidenced by Bowers, in order to provide sufficient strength (from said tensile load carrier) to said data transmission cable.

Even though Paulsson in view of Bowers does not specifically mention an **insulation sheath** surrounding said twisted pair cable, however, Oswald et al., in the same field of endeavor, teaches a transmission cable for use in downhole environment (abstract), which has an outer insulation sheath around the inner conductor in order to provide insulation to said conductor (column 3 lines 27-40 and Figure 1 unit 24)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an insulation sheath surrounding the twisted

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pair cable disclosed by Paulsson in view of Bowers, as evidenced by Oswald et al., in order to provide insulation to said twisted pair cable.

Regarding claims 4 and 9, Bowers does teach the filaments are being distributed about the perimeter of the load-carrying sheath in radial layers (Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art to provide filaments being distributed about the perimeter of the load-carrying sheath in radial layers to the cable disclosed by Paulsson, as evidenced by Bowers, in order to provide sufficient to the data cable disclosed by Paulsson.

Claims 8 and 12 are rejected for the same reasons as claim 6.

Regarding claim 11, even though Paulsson in view of Bowers and Oswald et al. does not specifically suggest a data cable having an effective capacitance between the twisted pair of conductors of less than 30 pF per foot of cable length, however since there is no indication in the specification regarding the criticality as to why the effective capacitance of said twisted pair cable has to be less than 30pF per foot of the cable length, one skilled practitioner in the art would recognize that such a design can be simply achieved through design experiment in order to determine the parameters that would achieve optimal results.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paulsson U.S. Patent 6,206,133 in view of Bowers U.S. Patent 3,259,675 and in further

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view of Oswald et al. U.S. Patent 6,127,632 and in further view of Veneruso U.S. Patent 5,521,592.

Regarding claim 10, Paulsson in view of Bowers and Oswald et al. does not specifically teach a sensor selected from a group consisting of pressure sensor, temperature sensor or flow sensor.

Veneruso, in the same field of endeavor, teaches a well logging system, which includes pressure sensor, temperature sensor and flow sensor (column 3, lines 44-59).

6. Claims 2, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulsson U.S. Patent 6,206,133 in view of Bowers U.S. Patent 3,259,675 and Oswald et al. U.S. Patent 6,127,632 and in further view of Belaigues et al. U.S. Patent 4,355,310.

Regarding claims 2 and 13, as already mentioned above, Paulsson in view of Bowers and Oswald et al. teaches a well logging system as claimed in claim 2, except a modem being complementarily included to the transmitter and the receiver.

Belaigues et al., in the same field of endeavor, teaches a cable well logging system wherein the transmitter (Figure 1, unit 34) and the receiver (Figure 1, unit 24) each includes a signal modem (Figure 1, units 22 and 30) complementary to each other, for transmitting data up and down the surface of the well.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a modem to the transmitter and the receiver of the well logging system disclosed by Paulsson in view of Bowers and Oswald et al., as

evidenced by Belaigues et al., in order to transmit data up and down the borehole, as described above.

Regarding claim 5, the transmission cable taught by Bowers also includes filaments in outer radial layers of the sheath that are greater in size than those of interior layers (Figure 2, filaments in layer 10 are greater in size than filaments in layer 12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide filaments in outer radial layers of the sheath that are greater in size than those of interior layers, to the transmission cable disclosed by Paulsson, as evidenced by Bowers, in order to achieve a strong tensile load sheath for the transmission cable as disclosed by Paulsson in view of Bowers.

7. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulsson U.S. Patent 6,206,133 in view of Bowers U.S. Patent 3,259,675 and Oswald et al. U.S. Patent 6,127,632 and Belaigues et al. U.S. Patent 4,355,310 and in further view of Doyle et al. U.S. Patent 5,504,479.

Regarding claims 3 and 14, as mentioned above, Paulsson in view of Bowers, Oswald et al. and Belaigues et al. teaches a well logging system as claimed in claim 3, except utilizing data encoding and decoding methods selected from the group consisting of QAM, CAP and DMT.

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Doyle et al., in the same field of endeavor, teaches a CAP (carrierless amplitude and phase) modulation telemetry for use in a well logging system in order to encode/decode transmitting data in said well logging system (column 2, lines 42-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a CAP encoding/decoding method to the well logging system disclosed by Paulsson in view of Bowers, Oswald et al. and Belaigues et al., as evidenced by Doyle et al., in order to encode/decode data for transmission in said well logging system.

Conclusion

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Dang whose telephone number is 703-305-1836. The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik, can be reached on (703) 305-4704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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Hung Dang

5/6/2004

H.D.

HD

MICHAEL HORABIK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

A handwritten signature in black ink, appearing to read "Michael Horabik", written in a cursive style.